Fig1

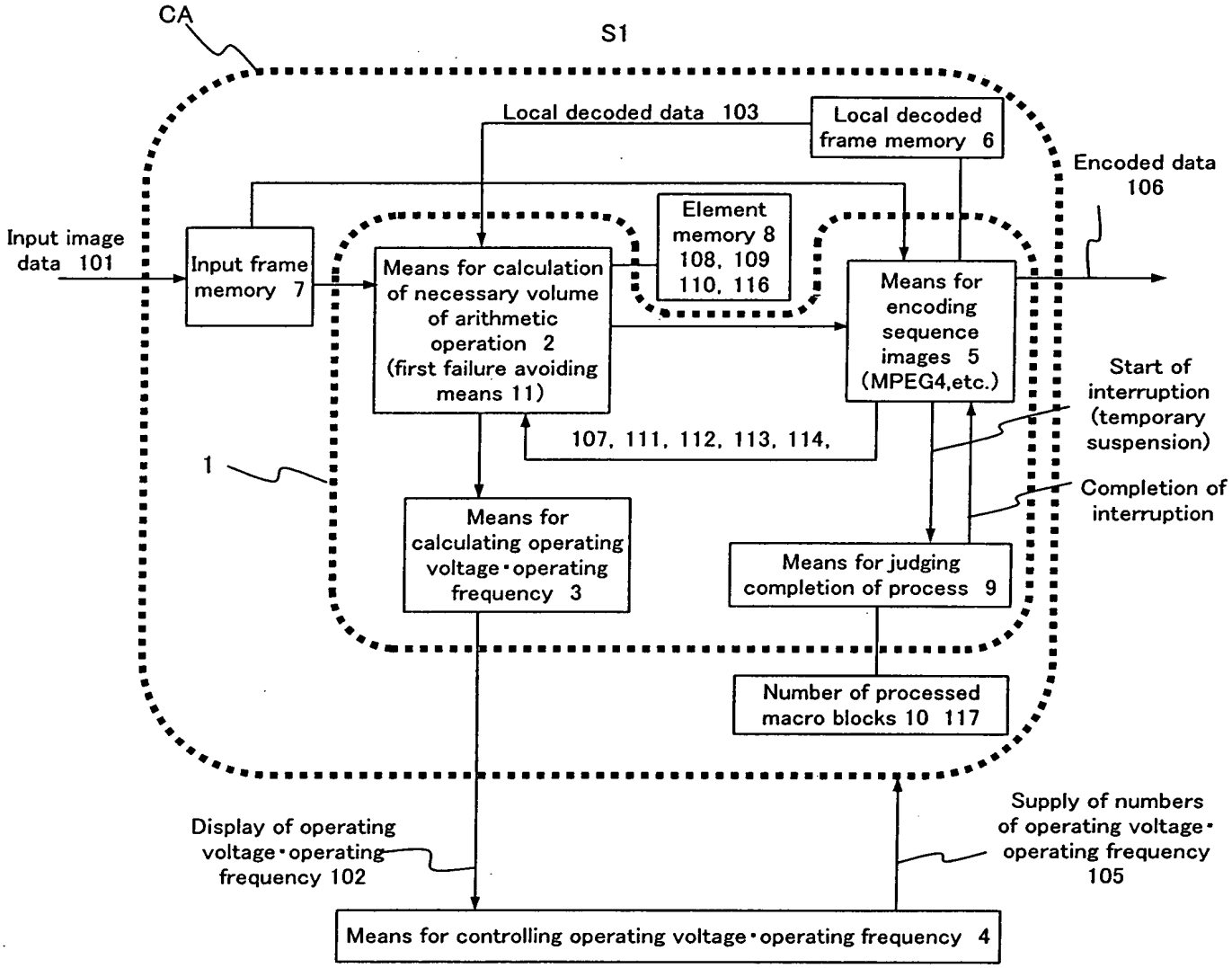

CA
S1
Local decoded data 103
Local decoded frame memory 6
Encoded data 106
Input image data 101
Input frame memory 7
Element memory 8 108, 109 110, 116
Means for calculation of necessary volume of arithmetic operation 2 (first failure avoiding means 11)
Means for encoding sequence images 5 (MPEG4,etc.)
Start of interruption (temporary suspension)
107, 111, 112, 113, 114,
1
Completion of interruption
Means for calculating operating voltage・operating frequency 3
Means for judging completion of process 9
Number of processed macro blocks 10 117
Display of operating voltage・operating frequency 102
Supply of numbers of operating voltage・operating frequency 105
Means for controlling operating voltage・operating frequency 4

Fig2

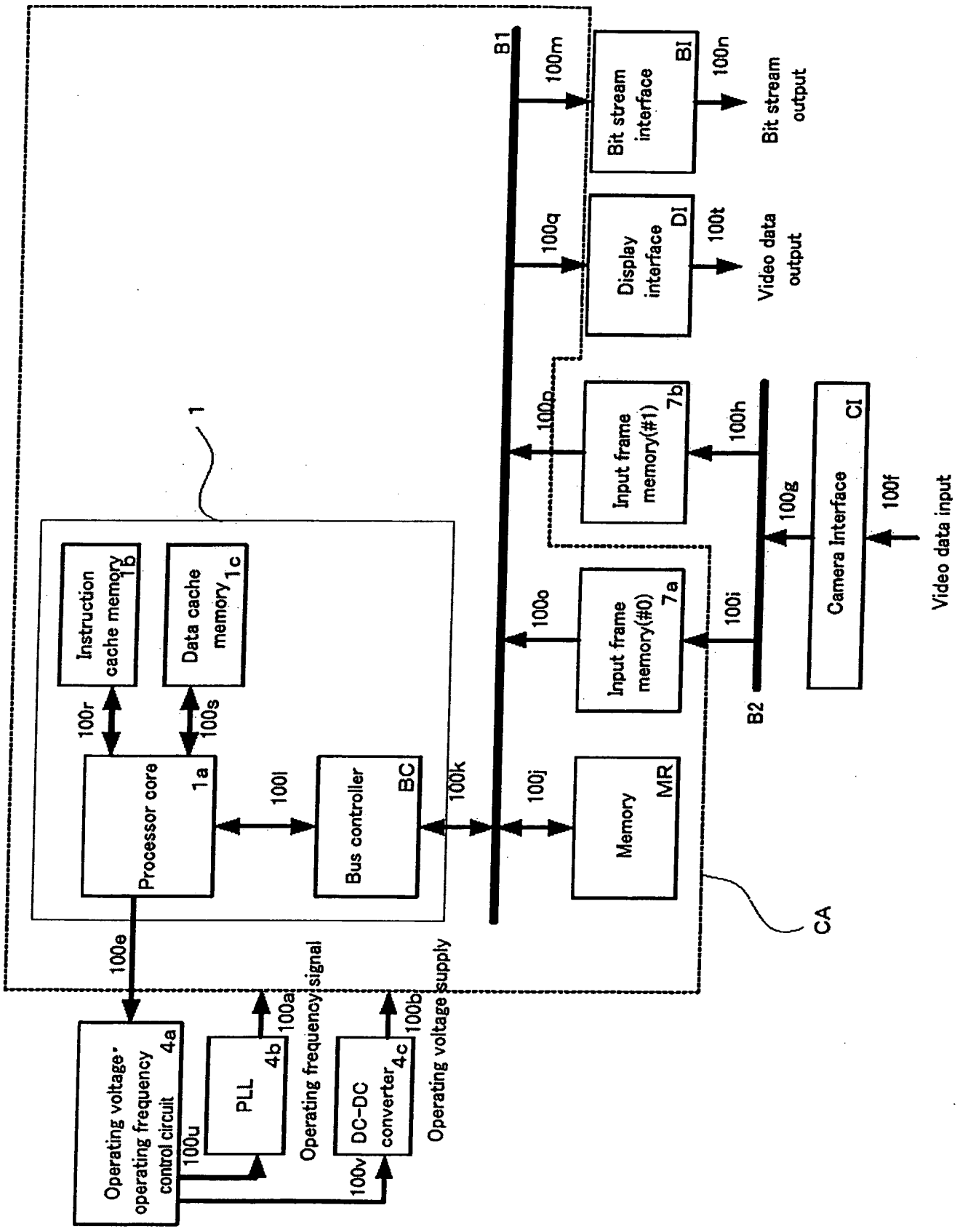

1
Instruction cache memory 1b
Data cache memory 1c
Processor core 1a
Bus controller BC
Memory MR
Input frame memory(#0) 7a
Input frame memory(#1) 7b
Camera Interface CI
Bit stream interface BI
Display interface DI
Operating voltage・operating frequency control circuit 4a
PLL 4b
DC-DC converter 4c
B1
B2
CA
100a
100b
100e
100f
100g
100h
100i
100j
100k
100l
100m
100n
100o
100p
100q
100r
100s
100t
100u
100v
Operating frequency signal
Operating voltage supply
Bit stream output
Video data output
Video data input

Fig3

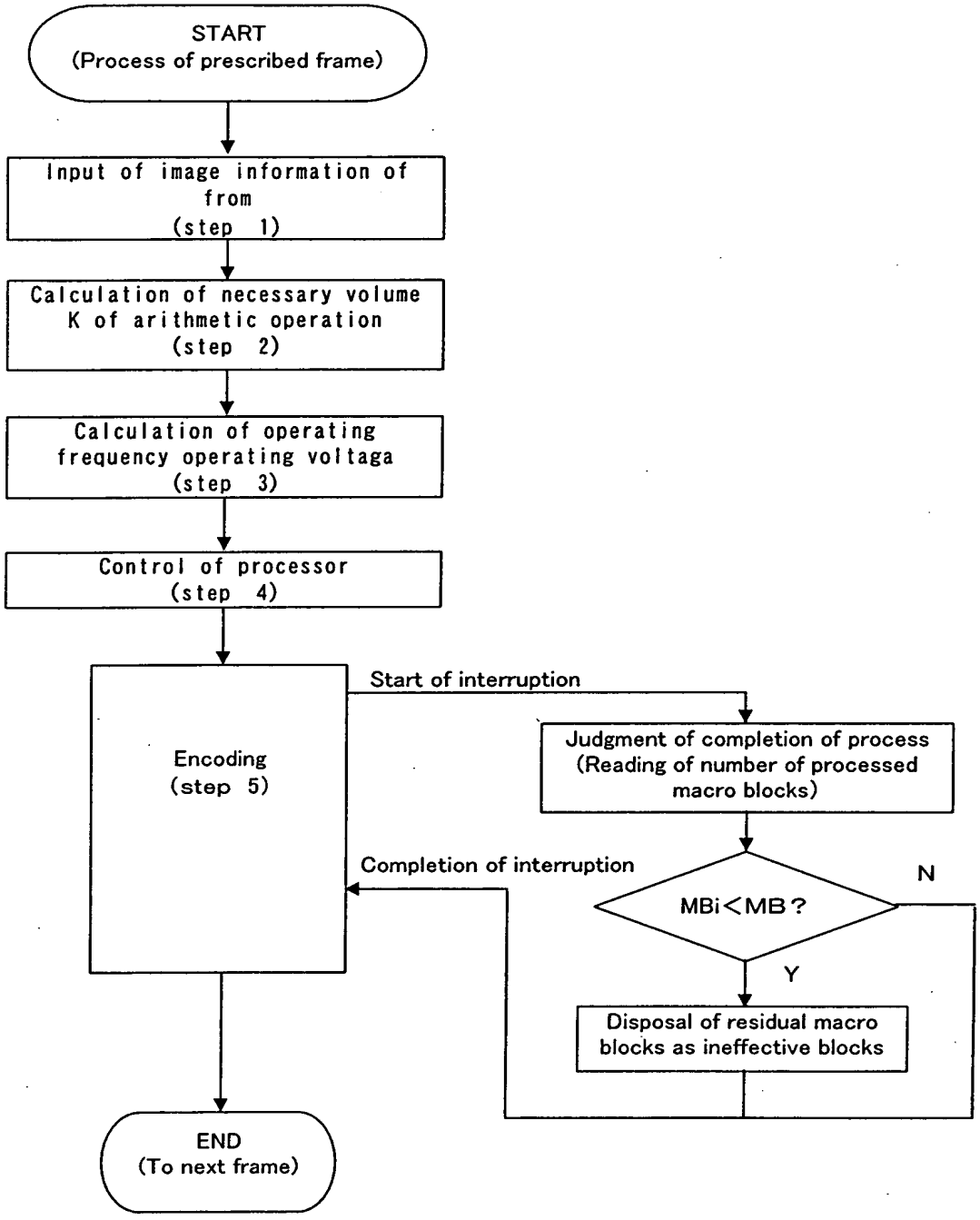

START
(Process of prescribed frame)
Input of image information of from
(step 1)
Calculation of necessary volume K of arithmetic operation
(step 2)
Calculation of operating frequency operating voltaga
(step 3)
Control of processor
(step 4)
Encoding
(step 5)
Start of interruption
Judgment of completion of process
(Reading of number of processed macro blocks)
MBi<MB?
N
Y
Completion of interruption
Disposal of residual macro blocks as ineffective blocks
END
(To next frame)

Fig4

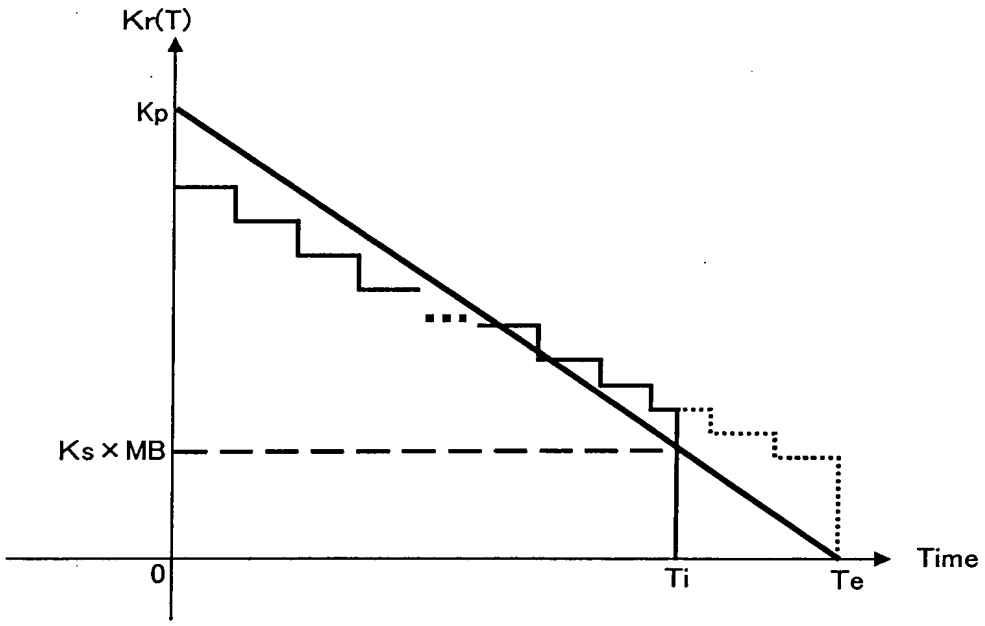
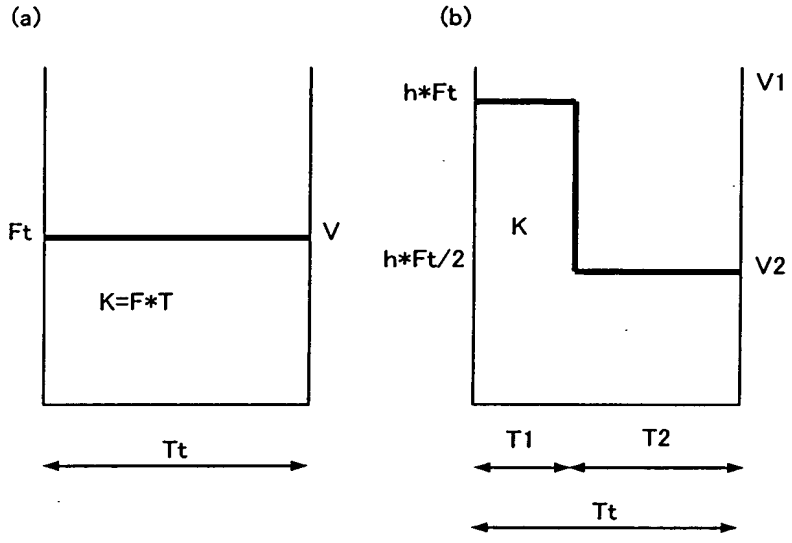


Fig5

Operating frequency (cycle／second)	Operating voltage (V)
f (1)	V (1)
f (2)	V (2)
f (3)	V (3)
・	・
f (r)	V (r)

When t＞s (t and s denotes natural numbers of not more than r)
f (t) ＞ f (s)
V (t) ＞ f (s)

Fig6



Case 1

Case 2

Fig7

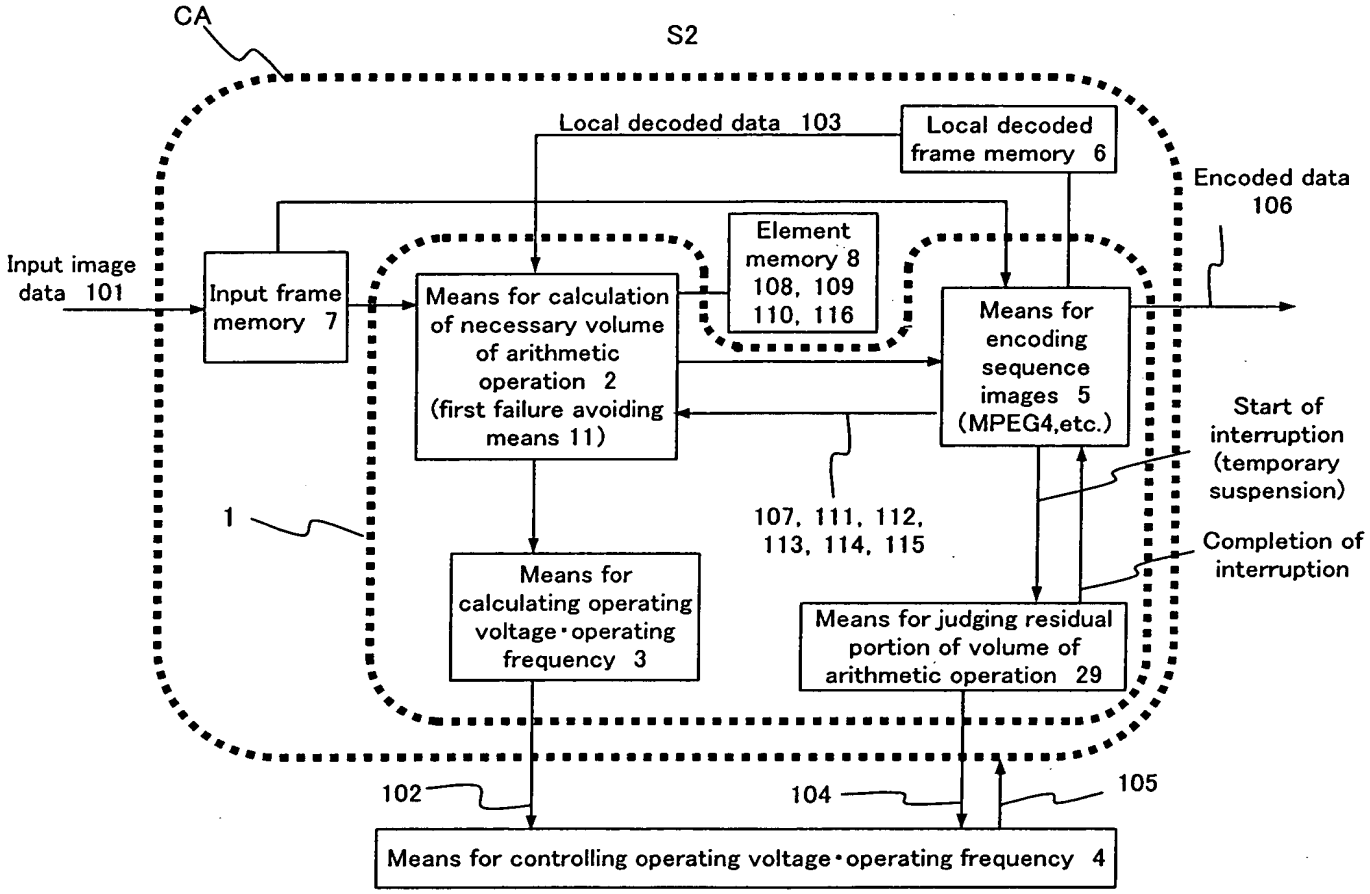

CA
S2
Local decoded data 103
Local decoded frame memory 6
Encoded data 106
Input image data 101
Input frame memory 7
Element memory 8 108, 109 110, 116
Means for calculation of necessary volume of arithmetic operation 2 (first failure avoiding means 11)
Means for encoding sequence images 5 (MPEG4,etc.)
Start of interruption (temporary suspension)
1
107, 111, 112, 113, 114, 115
Completion of interruption
Means for calculating operating voltage・operating frequency 3
Means for judging residual portion of volume of arithmetic operation 29
102
104
105
Means for controlling operating voltage・operating frequency 4

Fig8

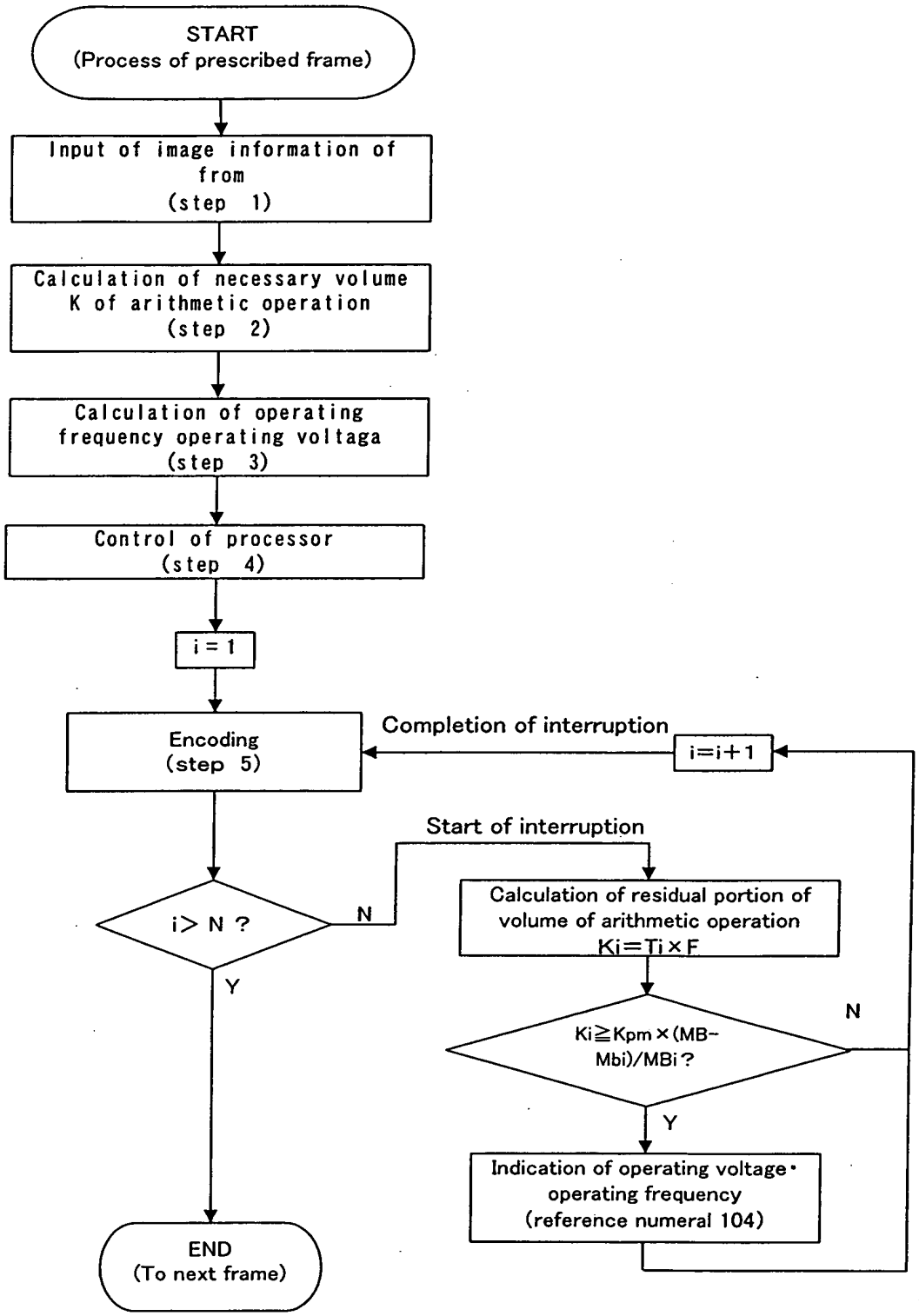

START
(Process of prescribed frame)
Input of image information of from
(step 1)
Calculation of necessary volume K of arithmetic operation
(step 2)
Calculation of operating frequency operating voltaga
(step 3)
Control of processor
(step 4)
i = 1
Encoding
(step 5)
Completion of interruption
i=i+1
Start of interruption
i> N ?
N
Y
Calculation of residual portion of volume of arithmetic operation
Ki=Ti×F
Ki≧Kpm×(MB-Mbi)/MBi ?
N
Y
Indication of operating voltage・operating frequency
(reference numeral 104)
END
(To next frame)

Fig9

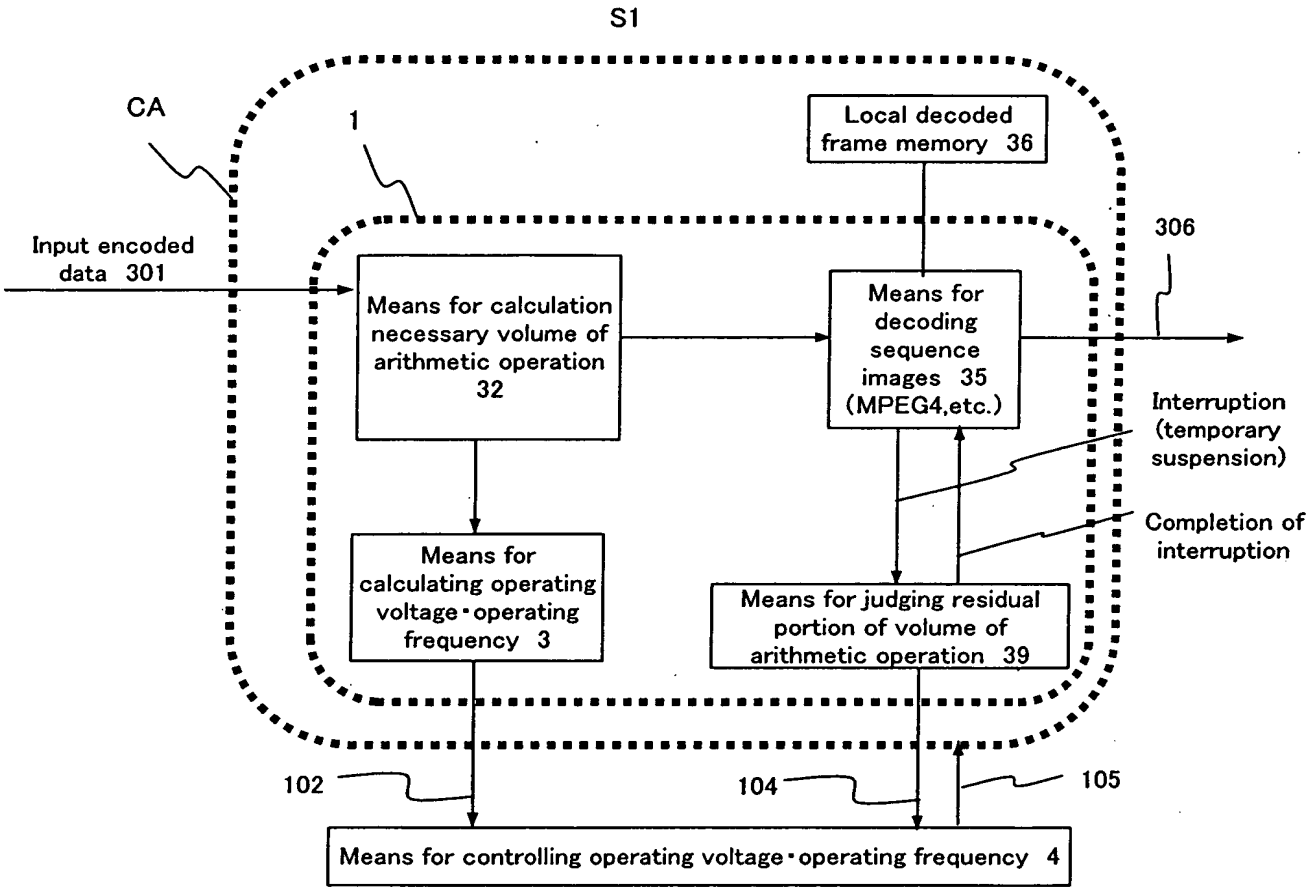
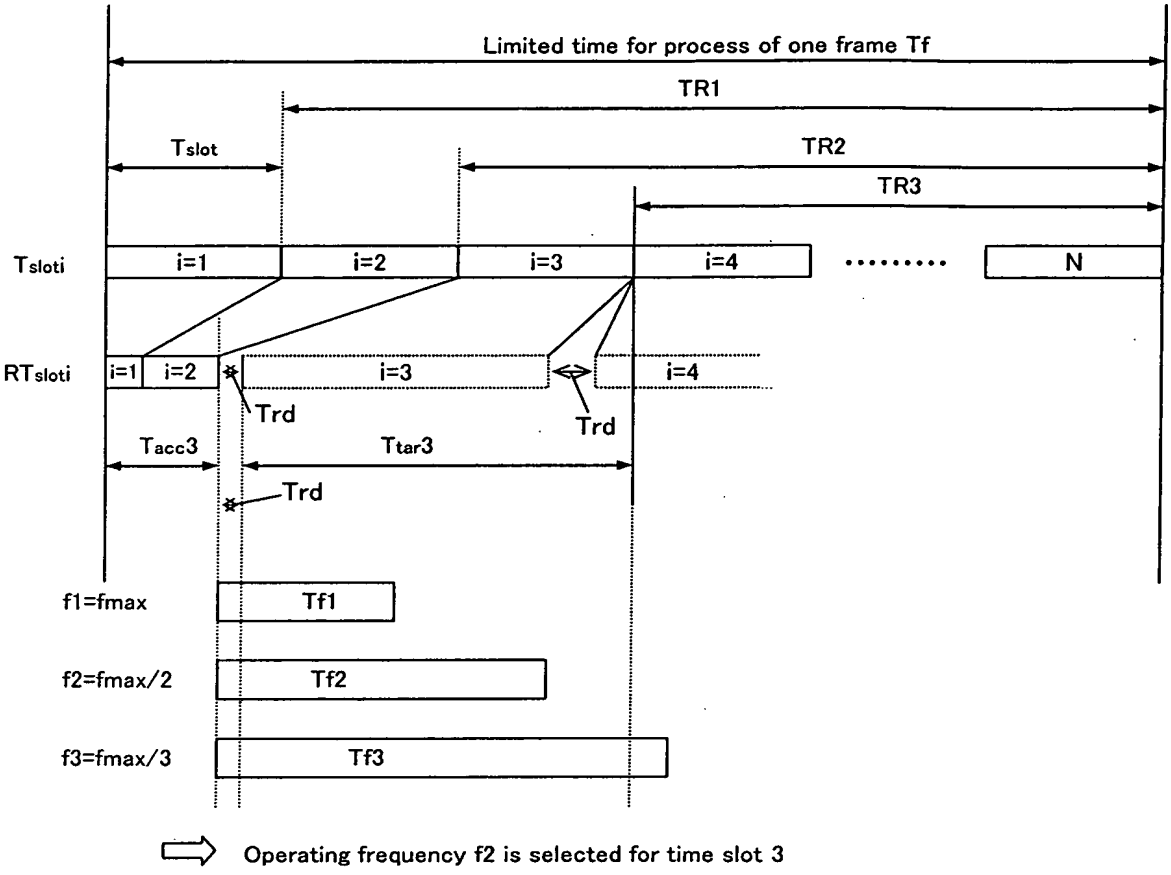

S1
CA
1
Local decoded frame memory 36
306
Input encoded data 301
Means for calculation necessary volume of arithmetic operation 32
Means for decoding sequence images 35 (MPEG4,etc.)
Interruption (temporary suspension)
Completion of interruption
Means for calculating operating voltage・operating frequency 3
Means for judging residual portion of volume of arithmetic operation 39
102
104
105
Means for controlling operating voltage・operating frequency 4

Fig910



⇨ Operating frequency f2 is selected for time slot 3

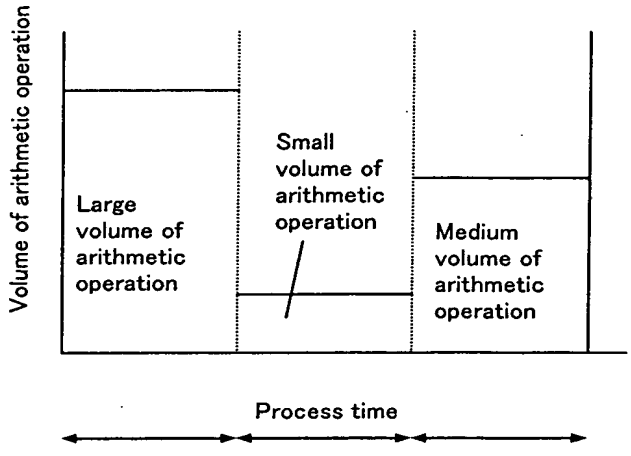



Fig11